Name KEY Date _____ Class 1st Qtrly

4 ATOMIC STRUCTURE

Practice Problems

In your notebook, solve the following problems.

SECTION 4.1 DEFINING THE ATOM

1. According to Figure 5.2, 100,000,000 copper atoms would form a line 1 cm long. How long would a line formed by 1×10^7 copper atoms be? Express your answer in millimeters. 1 mm

$\frac{1 \times 10^7 \text{ at}}{} \times \frac{1 \text{ cm}}{1 \times 10^8 \text{ at}} \times \frac{10 \text{ mm}}{1 \text{ cm}}$

SECTION 4.2 STRUCTURE OF THE NUCLEAR ATOM

1. A sulfur-32 atom contains 16 protons, 16 neutrons, and 16 electrons. What is the mass (in grams) of a sulfur-32 atom? 5.33×10^{-23} g

$16(1.67 \times 10^{-24} \text{ g}) + 16(1.67 \times 10^{-24} \text{ g})$

2. The mass of a neutron is 1.67×10^{-24} g. Approximately what number of neutrons would equal a mass of one gram? $\doteq 6 \times 10^{23}$ n

3. Which statement is consistent with the results of Rutherford's gold foil experiment?

   a. All atoms have a positive charge.

   b. Atoms are mostly empty space.

   c. The nucleus of an atom contains protons and electrons.

   d. Mass is spread uniformly throughout an atom.

SECTION 4.3 DISTINGUISHING BETWEEN ATOMS

1. How many protons are found in an atom of each of the following?

   a. boron 5 c. neon 10

   b. sulfur 16 d. lithium 3

2. Complete the table for the following elements.

Element	Number of Protons	Number of Electrons	Number of Neutrons	Atomic Number	Mass Number
Manganese	25	25	30	25	55
Sodium	11	11	12	11	23
Bromine	35	35	45	35	80
Yttrium	39	39	50	39	89
Arsenic	33	33	42	33	75
Actinium	89	89	138	89	227

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